WHAT IS CLAIMED IS:

1. A method of depositing a thin film on a substrate, the method comprising the steps of:

ablating a target with a laser beam creating a plume;

introducing the plume into a confinement magnet for focusing the plume and reducing divergence thereof, the confinement magnet generating a first magnetic field substantially parallel to a plume ejection direction from the target;

collecting the plume at a first angle and concentrating the plume toward the substrate utilizing a tapered pulsed coil such that has an inward taper from a first end which defines the first angle; and

depositing the charged species on the substrate.

2. The method of claim 1, further including the step of

deflecting the plume towards the substrate to deposit the charged species on the substrate subsequent to the plume being influenced by the tapered pulsed coil, the plume being deflected and swept across the substrate by at least two deflector plates which are operatively coupled to a voltage source.

3. The method of claim 2, wherein the voltage source coupled to the deflector plates is an AC voltage source, the deflector plates promoting greater film thickness uniformity over a region of the substrate.

4. The method of claim 2, further including:

providing a mask between the deflector plates and the substrate for patterning the deposition.

5. The method of claim 1, further including:

activating the laser beam only when current in the pulsed coil reaches a predetermined value.

6. The method of claim 5, wherein the predetermined value is greater than or equal to about 200 A.

7. The method of claim 1, further including the step of:

rotating one of the substrate and the target.

8. The method of claim 1, wherein the pulsed coil includes a 45 degree bend incorporated therein to avoid any direct line of sight between the target and the substrate.

9. The method of claim 1, wherein the pulsed coil has a through bore formed therethrough for collecting and concentrating the plume as it travels towards the substrate, the through bore having a first end with a first diameter and a

second end which a second diameter less than the first diameter such that the through bore is inwardly tapered from the first end to the second end.

10. A tapered profile magnetic field pulsed laser deposition (PLD) system for depositing a thin film on a substrate, the system comprising:

a platform for holding a target;

a laser source producing a laser beam that is focused on the target to form a plume;

a confinement magnetic device disposed proximate to the target such that the plume is influenced by a first magnetic field generated by the confinement magnetic device, the first magnetic field causing the plume to become more focused, thereby reducing the divergence thereof, the first magnetic field being substantially parallel to a plume ejection direction of the plume as it travels away from the target; and

a tapered pulsed coil arranged relative to the confinement magnetic device so that the focused plume discharged from the confinement magnetic device is collected and concentrated by an inwardly tapered surface of the tapered pulsed coil which causes the plume to be deflected towards a substrate on which the charged species are deposited to form the thin film.

11. The system of claim 10, wherein the target is selected from the group consisting of titanium, aluminum, aluminum nitride, titanium nitride, carbon, titanium carbide and a combination thereof.

12. The system of claim 10, wherein the laser beam is a pulsed laser beam.

13. The system of claim 10, wherein the confinement magnetic device is formed of a first permanent magnet and a second permanent magnet, each of the first and second permanent magnets having a north (N) pole and a south (S) pole, the first and second permanent magnets being arranged so that the respective north poles oppose one another and the respective south poles oppose one another.

14. The system of claim 13, wherein the first and second permanent magnets are spaced apart, forming a gap therebetween, the plume being directed into and traveling within the gap from one end of the confinement magnetic device to the other end thereof.

15. The system of claim 10, wherein the tapered pulsed coil has a through bore formed therethrough for collecting and concentrating the plume as it travels towards the substrate, the through bore having a first end with a first diameter and a second end which a second diameter less than the first diameter such that the through bore is inwardly tapered from the first end to the second end resulting in a focusing of the plume in a direction toward the substrate.

16. The system of claim 10, wherein the tapered pulsed coil is operatively coupled to the laser such that the laser is activated only when current in the pulsed coil reaches a predetermined value.

17. The system of claim 16, wherein the predetermined value is equal to or approximately about 200 A.

18. The system of claim 10, further including:

a pair of deflector plates disposed between the pulsed coil and the substrate for deflecting the plume towards the substrate to deposit the components of the plume on the substrate subsequent to the plume being influenced by the tapered pulsed coil, the pair of deflector plates being operatively coupled to a voltage source.

19. The system of claim 18, wherein the voltage source coupled to the deflector plates is an AC voltage source, the deflector plates promoting greater film thickness uniformity over a region of the substrate.

20. The system of claim 18, further including:

a mask disposed between the deflector plates and the substrate for patterning the deposition.

21. The system of claim 10, wherein the target is part of a plurality of targets coupled to a rotatable ring holder, each a surface of each target is beveled about 15 degrees away from a plane of the ring holder.

22. The system of claim 21, wherein the laser beam is directed at 45 degrees to the plane of the ring holder and impacts the target surface at an angle of from about 30 degrees to about 60 degrees as the ring holder rotates.

23. A device for maintaining cleanliness of an interior of a deposition chamber laser entry window through which a laser beam enters and converges to a target, the device comprising:

a pair of first members disposed between the laser entry window and the target, the first members being spaced a distance apart from one another;

a pair of radioactive members disposed in the space between the pair of first members; and

wherein first members are operatively connected to a voltage source and ground so that a voltage potential difference is created therebetween, the converging laser beam entering the space between the first members at one end thereof and traveling therebetween in a converging manner toward the target and wherein a plume that is generated when the laser beam ablates the target is ionized as a result of the radioactive members such that the ionized plume is deflected toward one of the first members as opposed to coating the interior of the laser entry window.

24. The device of claim 23, wherein each of the first members comprises a conductive plate, one of the conductive plates being connected to the voltage source, the other being connected to ground.

25. The device of claim 23, wherein each of the radioactive members comprises a radioactive plate.

26. The device of claim 25, wherein the radioactive plates are attached to backsides of the first members which are in the form of metal plates.

27. The device of claim 26, wherein first ends of the radioactive plates align with first ends of the metal plates and each radioactive plate has a length less than a length of the metal plate.

28. The device of claim 27, wherein the length of each radioactive plate is about ½ the length of the metal plate.

29. The device of claim 23, further including a plurality of insulating posts disposed between the first members at locations which are free of the radioactive members.

30. The device of claim 29, wherein the insulating posts space the metal plates apart by about 3 cm.

31. A method for maintaining cleanliness of an interior of a deposition chamber laser entry window through which a laser beam enters and converges to a target, the method including the steps of:

disposing a pair of first members between the laser entry window and the target, the first members being spaced a distance apart from one another;

disposing a pair of radioactive members in a space between the pair of first members;

operatively connecting the first members to a voltage source and ground, respectively, so that a voltage potential difference is created therebetween;

ablating the target with a laser beam creating a plume; and

ionizing components of the plume as a result of the influence of the radioactive members thereon such that the ionized plume is deflected toward one of the first members as opposed to coating the interior of the laser entry window.

32. The method of claim 31, wherein the voltage potential difference is about 1500 V.

33. The method of claim 31, wherein each of the first members comprises a conductive plate, one of the conductive plates being connected to the voltage source, the other being connected to ground, each of the radioactive

members comprising a radioactive plate that is attached to one backside of one first member.

34. The method of claim 33, further including the step of:

aligning first ends of the radioactive plates with first ends of the metal plates, wherein each radioactive plate has a length less than a length of the metal plate.

35. The method of claim 31, further including the step of:

disposing a plurality of insulating posts between the first members at locations which are free of the radioactive members.